



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/615,545	07/13/2000	Teng Xu	2000B009A	4214

7590 12/19/2002

ExxonMobil Chemical Company
Law Technology
PO BOX 2149
Baytown, TX 77522

EXAMINER

YILDIRIM, BEKIR L

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 12/19/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/615,545

Applicant(s)

XU ET AL

Examiner

Bekir L. YILDIRIM

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-50 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 and 5. 6) ☐ Other:

DETAILED ACTION

Double Patenting

1. Claims 1-50 of this application conflict with claims 1-50 of Application No. 09/615,545. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

Claims 1-50 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-50 of copending Application No. 09/615,545. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

Art Unit: 1764

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-50 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kaiser (USP 4,677,242)

Kaiser discloses a new catalytic process for the production of light olefins, i.e., olefins having not more than four carbon atoms, from a feedstock comprising aliphatic hetero compounds or mixtures thereof in the presence of a silicoaluminophosphate molecular sieve catalyst and diluent correlated to the silicoaluminophosphate molecular sieve such that the average kinetic diameter of the diluent is greater than the median pore size of the silicoaluminophosphate molecular sieve.

The reference also discloses that silicoaluminophosphate molecular sieves (denominated "SAPOs") in the presence of a diluent having an average kinetic

Art Unit: 1764

diameter larger than the pores of the SAPOs are extremely efficient catalysts for the conversion of a feedstock comprising aliphatic hetero compounds, preferably methanol, ethanol, dimethyl ether, diethyl ether or mixtures thereof, to light olefins and that the two carbon, three carbon, and four carbon (C.sub.2 -C.sub.4) light olefin product content of the hydrocarbon reaction products generally comprises a major portion of the hydrocarbon products while methane and aromatics (other than the diluent) typically comprise a minor portion thereof. The selection of the diluent is correlated to the silicoaluminophosphate such that the average kinetic diameter of the diluent is greater than the median pore size of the silicoaluminophosphate molecular sieve. The preferred diluents are aromatic diluents as catalysts.

It is disclosed that by correlating the silicoaluminophosphate molecular sieves and diluent, e.g., an aromatic diluent, selectivity to C.sub.2 to C.sub.4 olefin products (i.e., ethylene, propylene, and butenes) of at least about 25 molar percent, based on the total hydrocarbon products formed, may be obtained, preferably in excess of 50 mole percent. It has been observed that the formation, if any, of aromatic hydrocarbons (exclusive of the aromatic diluent) is below that which is detectable by standard vapor phase chromatographic techniques (cols 5, 6). The selection of the diluent is such that the diluent is correlated to the selected silicoaluminophosphate such that the average kinetic diameter of the diluent molecules is greater than the average pore size of the silicoaluminophosphate molecular sieve. The selection of the diluent is also

Art Unit: 1764

related to the relative stability of the diluent under the process conditions.

The average pore sizes of the SAPOs are such that the diluent is generally one or more cyclic compounds having 5 or more atoms in the ring, e.g., cycloalkanes, cycloalkenes, pyridine and aromatic compounds. The diluent should be thermally stable under the process conditions. Aromatic compounds employable herein include compounds of the formula: ##STR1## wherein R.sub.1, R.sub.2, R.sub.3, R.sub.4, R.sub.5, R.sub.6 may be alkyl, alkylaryl, aralkyl, aryl and mixtures thereof, containing 1 to 20 carbon atoms and optionally, hetero atoms (S, N, Cl, etc). The diluent may be selected from the group consisting of: cycloalkanes and substituted cycloalkanes (cyclopentane, cyclohexane); pyridine and substituted pyridine; benzene; alkyl benzenes including toluene, o-xylene, m-xylene, p-xylene, hemimellitene, pseudocumene, mesitylene, prehnitene, isodurene, durene, pentamethylbenzene, hexamethylbenzene, ethylbenzene, n-propylbenzene, cumene, n-butylbenzene, isobutylbenzene, sec-butylbenzene, tert-butylbenzene, p-cymene; biphenyl, diphenylmethane; triphenylmethane; 1,2-diphenylethane; anthracene; naphthalene; and the like (col. 8, lines 30-68)..

The reference therefore is believed to anticipate the claimed invention. It might be argued that the invention in the claims differ from that in the reference in that the reference does not disclose the methanol conversion activity index of the catalyst under recited conditions. Even if such distinction is made the invention would have at least been obvious to one having ordinary skill in the art since the catalyst described as substantially similar otherwise would be expected

to perform similarly in methane methanol conversion as well. Note that the Office does not have the capability to test each claimed product to ascertain whether it will perform as claimed. Therefore, Once a product substantially similar to that claimed is disclosed in the reference, the burden is shifted to the applicant to show that the product in the reference would not function similarly. Alternatively, the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, >562 F.2d 1252, 1254, <195 USPQ 430, 433 (CCPA 1977).” (MPEP 2112).

5. Claims 1-50 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Brown et al. (US-PAT-NO: 6046372).

Brown et al. teaches a process for converting methanol and/or dimethyl ether to a product containing C.sub.2 to C.sub.4 olefins which comprises the step of contacting a feed which contains methanol and/or dimethyl ether with a catalyst comprising a porous crystalline material, said contacting step being conducted in the presence of an aromatic compound under conversion conditions including a temperature of 350.degree. C. to 480.degree. C. and a methanol partial pressure in excess of 10 psia (70 kPa), said porous crystalline material having a pore size greater than the critical diameter of the aromatic compound and the aromatic compound being capable of alkylation by the methanol and/or dimethyl ether under said conversion conditions. (abstract). The process comprises contacting the feed with a catalyst comprising a porous crystalline material, said contacting step being conducted in the presence of **an aromatic compound under** conversion conditions

} admits
aromatic

Art Unit: 1764

including a temperature of 350.degree. C. to 480.degree. C. and a methanol partial pressure in excess of 10 psia (70 kPa), said porous crystalline material having a pore size greater than the critical diameter of the aromatic compound and the aromatic compound being capable of alkylation by the methanol and/or dimethyl ether under said conversion conditions. The catalysts employed in the process of the invention is a porous crystalline material which has a pore size greater than the critical diameter of the aromatic compound co-feed, selected from a group including medium pore acidic metallosilicates, such as silicoaluminophosphates (SAPOs), can be used in the process of the invention. (col. 2, lines 35-60, col. 5, lines 10-240).

The reference therefore is believed to anticipate the claimed invention. It might be argued that the invention in the claims differ from that in the reference in that the reference does not disclose the methanol conversion activity index of the catalyst under recited conditions. Even if such distinction is made the invention would have at least been obvious to one having ordinary skill in the art since the catalyst described as substantially similar otherwise would be expected to perform similarly in methane methanol conversion as well. Note that the Office does not have the capability to test each claimed product to ascertain whether it will perform as claimed. Therefore, Once a product substantially similar to that claimed is disclosed in the reference, the burden is shifted to the applicant to show that the product in the reference would not function similarly. Alternatively, the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, >562 F.2d 1252, 1254, <195 USPQ 430, 433 (CCPA 1977)." (MPEP 2112).

The reference therefore is believed to anticipate the claimed invention. It might be argued that the invention in the claims differ from that in the reference in that the reference does not disclose the methanol conversion activity index of the catalyst under recited conditions. Even if such distinction is made the invention would have at least been obvious to one having ordinary skill in the art since the catalyst described as substantially similar otherwise would be expected to perform similarly in methane methanol conversion as well. Note that the Office does not have the capability to test each claimed product to ascertain whether it will perform as claimed. Therefore, Once a product substantially similar to that claimed is disclosed in the reference, the burden is shifted to the applicant to show that the product in the reference would not function similarly. Alternatively, the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977)." (MPEP 2112).

6. Claims 1-50 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kuechler et al. (US-PAT-NO: 6137022) .

Kuechler et al. teaches a method of making an olefin product from an oxygenate Feedstock comprising contacting the feedstock in a reaction zone containing 15 volume percent or less of a catalyst comprising a silicoaluminophosphate molecular sieve material, and maintaining conversion of the feedstock between 80% and 99% under conditions effective to convert 100% of the feedstock when the reaction zone contains at least 33 volume percent of the molecular sieve material. Preferably, the 15 volume percent of the catalyst is

Art Unit: 1764

distributed throughout the reaction zone. It can be distributed as a multilayer fixed bed or in a homogeneous fashion, including distribution as a fluidized bed or a flowing bed fashion. Preferably, the 33 volume percent of the catalyst is homogeneously dispersed throughout the reaction zone.

In a preferred embodiment the catalyst comprises a silicoaluminophosphate selected from the group consisting of SAPO-5, SAPO-8, SAPO-11, SAPO-16, SAPO-17, SAPO-18, SAPO-20, SAPO-31, SAPO-34, SAPO-35, SAPO-36, SAPO-37, SAPO-40, SAPO-41, SAPO-42, SAPO-44, SAPO-47, SAPO-56, and the metal substituted forms thereof. The catalyst can also include a binder material. Preferably, the oxygenate feedstock should be contacted in the vapor phase in a reaction zone with the defined molecular sieve catalyst at effective process conditions so as to produce the desired olefins, i.e., an effective temperature, pressure, WHSV (Weight Hourly Space Velocity) and, optionally, an effective amount of diluent, correlated to produce olefins. Alternately, the process may be carried out in a liquid or a mixed vapor/liquid phase. When the process is carried out in the liquid phase or a mixed vapor/liquid phase, different conversions and selectivities of feedstock-to-One or more diluents may be fed to the reaction zone with the oxygenates, such that the total feed mixture comprises diluent in a range of from about 1 mol % and about 99 mol %. Diluents which may be employed in the process include, but are not necessarily limited to, helium, argon, nitrogen, carbon monoxide, carbon dioxide, hydrogen, water, paraffins, other hydrocarbons (such as methane), aromatic compounds, and mixtures thereof. Preferred diluents are water and nitrogen (col. 1, line 63 – col. 3, line 56).

The reference therefore is believed to anticipate the claimed invention. It might be argued that the invention in the claims differ from that in the reference in that the reference does not disclose the methanol conversion activity index of the catalyst under recited conditions. Even if such distinction is made the invention would have at least been obvious to one having ordinary skill in the art since the catalyst described as substantially similar otherwise would be expected to perform similarly in methane methanol conversion as well. Note that the Office does not have the capability to test each claimed product to ascertain whether it will perform as claimed. Therefore, Once a product substantially similar to that claimed is disclosed in the reference, the burden is shifted to the applicant to show that the product in the reference would not function similarly. Alternatively, the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977)." (MPEP 2112).

8. Claims 1-50 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kuechler et al. (USP 6,437,208).

Applicant has provided evidence in this file showing that the invention was owned by, or subject to an obligation of assignment to, the same entity as US-PAT-NO: 6437208 at the time this invention was made. Accordingly, US-PAT-NO: 6,437,208 is disqualified as prior art through 35 U.S.C. 102(e), (f) or (g) in any rejection under 35 U.S.C. 103(a) in this application. However, this applied art additionally qualifies as prior art under another subsection of 35 U.S.C. 102 and accordingly is not disqualified as prior art under 35 U.S.C. 103(a).

Applicant may overcome the applied art either by a showing under 37 CFR 1.132 that the invention disclosed therein was derived from the inventor of this application, and is therefore, not the invention "by another", or by antedating the applied art under 37 CFR 1.131.

Kuechler et al. teaches a process wherein an oxygenate-containing feedstock comprising an oxygenate and a diluent, and optionally a hydrocarbon, each component introduced separately or in some combination, is contacted with a catalyst containing a SAPO molecular sieve at process conditions effective to produce olefins. The volume in which such contact takes place is herein termed the "reactor," which is a part of a "reactor apparatus" or "reaction system" or "reactor system." The "entrance of the reactor" is designated as the point of highest total pressure in the reactor where all or part of the oxygenate-containing feedstock encounter the SAPO molecular sieve.

also teaches a process for producing olefins from oxygenates wherein, one or more inert diluents may be present in the feedstock, for example, in an amount of from 1 to 99 molar percent, based on the total number of moles of all feed and diluent components fed to the reaction zone (or **catalyst**). As defined therein, diluents are compositions which are essentially non-reactive across a molecular sieve catalyst, and primarily function to make the oxygenates in the feedstock less concentrated. Typical diluents include, essentially **non-reactive paraffins** (especially the alkanes such as methane, ethane, and propane), essentially non-reactive alkylenes,

essentially non-reactive aromatic compounds, and mixtures thereof. In the process of the invention, a feed containing an oxygenate, and optionally a hydrocarbon, **either separately** or mixed with the oxygenate, is contacted with a catalyst containing a **SAPO molecular sieve** at process conditions effective to produce olefins in a reactor. In this invention, a feed containing an oxygenate is contacted in a reaction zone of a reactor apparatus with a molecular sieve catalyst at process conditions effective to produce olefins, i.e., an effective temperature, pressure, WHSV (weight hour space velocity) and, optionally, an effective amount of diluent, correlated to produce olefins, particularly ethylene and propylenes, i.e., ethylene and/or propylene. Usually, the oxygenate feed is contacted with the catalyst when the oxygenate is in a vapor phase. Alternately, the process may be carried out in a liquid or a mixed vapor/liquid phase. When the process is carried out in a liquid phase or a mixed vapor/liquid phase, different conversions and selectivities of feed-to-product may result depending upon the catalyst and reaction conditions (col. 3, line 63- col. 5, line 68).

The reference therefore is believed to anticipate the claimed invention. It might be argued that the invention in the claims differ from that in the reference in that the reference does not disclose the methanol conversion activity index of the catalyst under recited conditions. Even if such distinction is made the invention would have at least been obvious to one having ordinary skill in the art since the catalyst described as substantially similar otherwise would be expected to perform similarly in methane methanol conversion as well. Note that the Office does not have the capability to test each claimed product to ascertain whether it will perform as claimed.

Therefore, Once a product substantially similar to that claimed is disclosed in the reference, the burden is shifted to the applicant to show that the product in the reference would not function similarly. Alternatively, the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).” (MPEP 2112).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Searle et al. (US-PAT-NO: 6436869) teaches a process for producing olefins from oxygenates wherein a feed containing an oxygenate is contacted in a reaction zone of a reactor apparatus with an activated iron, cobalt and/or nickel containing ALPO bound SAPO catalyst at process conditions effective to produce light olefins, i.e., an effective temperature, pressure, WHSV (weight hour space velocity) and, optionally, an effective amount of diluent, correlated to produce light olefins.

dioxide, hydrogen, water, paraffins, alkanes (especially methane, ethane, and propane), alkylene, aromatic compounds, and mixtures thereof The preferred diluents are water and nitrogen. Water can be injected in either liquid or vapor form.

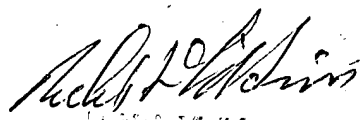
Janssen et al. (USP 6225254) teaches a process for producing olefins from oxygenates with a group of catalysts including silicoaluminophosphates wherein one or more oxygen depleted diluents may be present in the feedstock, for example, in an amount of from 1 to 99 molar percent, based on the total number of moles of all feed and diluent components fed to the reaction zone (or catalyst). Typical diluents include water, paraffins, alkanes (especially methane, ethane, and propane), alkylenes, aromatic compounds, and mixtures thereof.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bekir L. YILDIRIM whose telephone number is (703) 308-3586. The examiner can normally be reached on 10:30-8:00 (alternating Mondays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (703) 308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3599 for regular communications and (703) 872-9467 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0611.

BLY
December 10, 2002


Bekir L. Yildirim
Examiner